Chapter 15 Preapproved Wall Appendix: Specific Requirements and Details for LB Foster Retained Earth Concrete Panel Walls

In addition to the general design requirements provided in **Appendix 15-A**, the following specific requirements apply to the design of the LB Foster Retained Earth™ concrete 5 ft x 5 ft panel faced retaining wall:

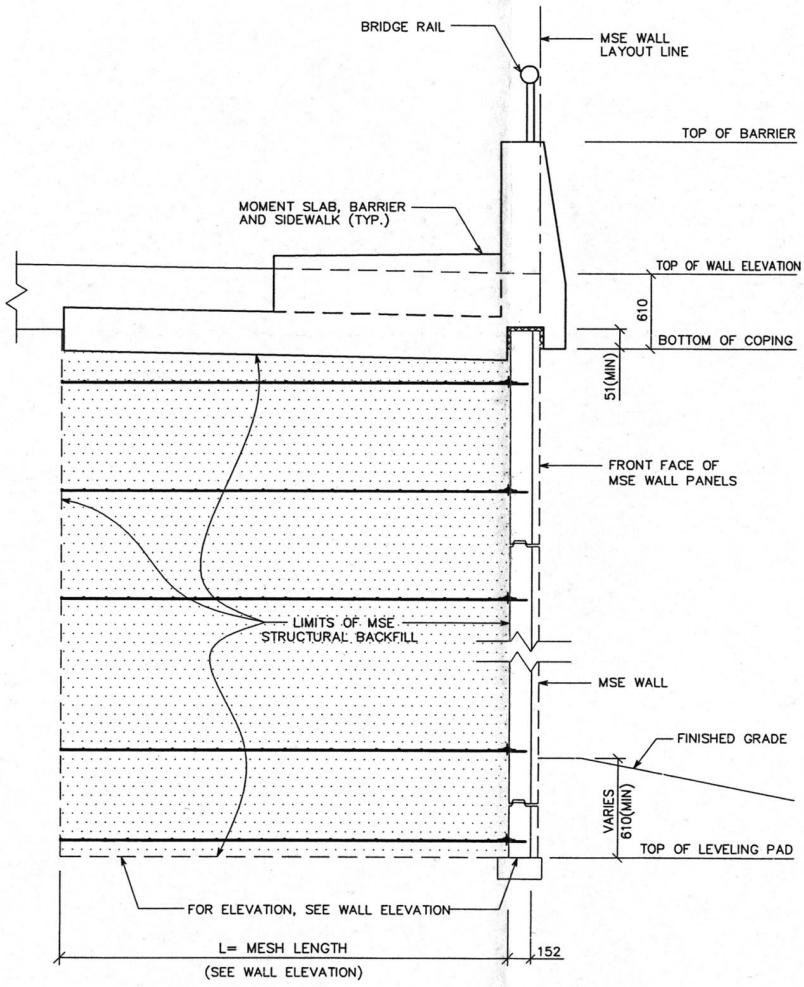
No HITEC evaluation report is currently available for this wall system. Design procedures for specific elements of the wall system have been provided to WSDOT in a binder dated September 11, 2003. The design procedures used by LB Foster (specifically Foster Geotechnical) are based on the AASHTO Standard Specifications for Highway Bridges (**2002**). Therefore, for internal stability of the wall, the AASHTO Simplified Method shall be used. Interim approval is given for the continued use of the AASHTO Standard Specifications as the basis for design.

Note the connector shall be designed to have adequate life considering corrosion loss. Furthermore, the connector loops embedded in the facing panels shall be lined up such that the steel grid reinforcement cross bar at the connection is uniformly loaded. Therefore, regarding the alignment of the bearing surfaces of the embedded wire loops, once the steel grid is inserted into the loops, no loop shall have a gap between the loop and the steel grid cross bar of more than 0.125 inch.

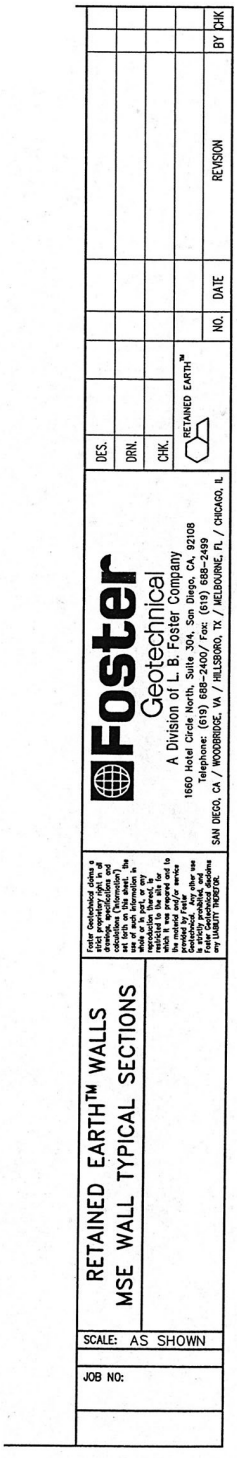
Reinforcement pullout shall be calculated based on the default values for steel grid reinforcement provided in the AASHTO Specifications. If, at some future time product and soil specific pullout data is provided to support use of non-default pullout interaction coefficients, it should be noted that LRFD pullout resistance design using these product and soil specific interaction coefficients has not been calibrated using product specific data statistics and reliability theory. Therefore, the specified resistance factors in the GDM and AASHTO LRFD Specifications should not be considered applicable to product specific pullout interaction coefficients.

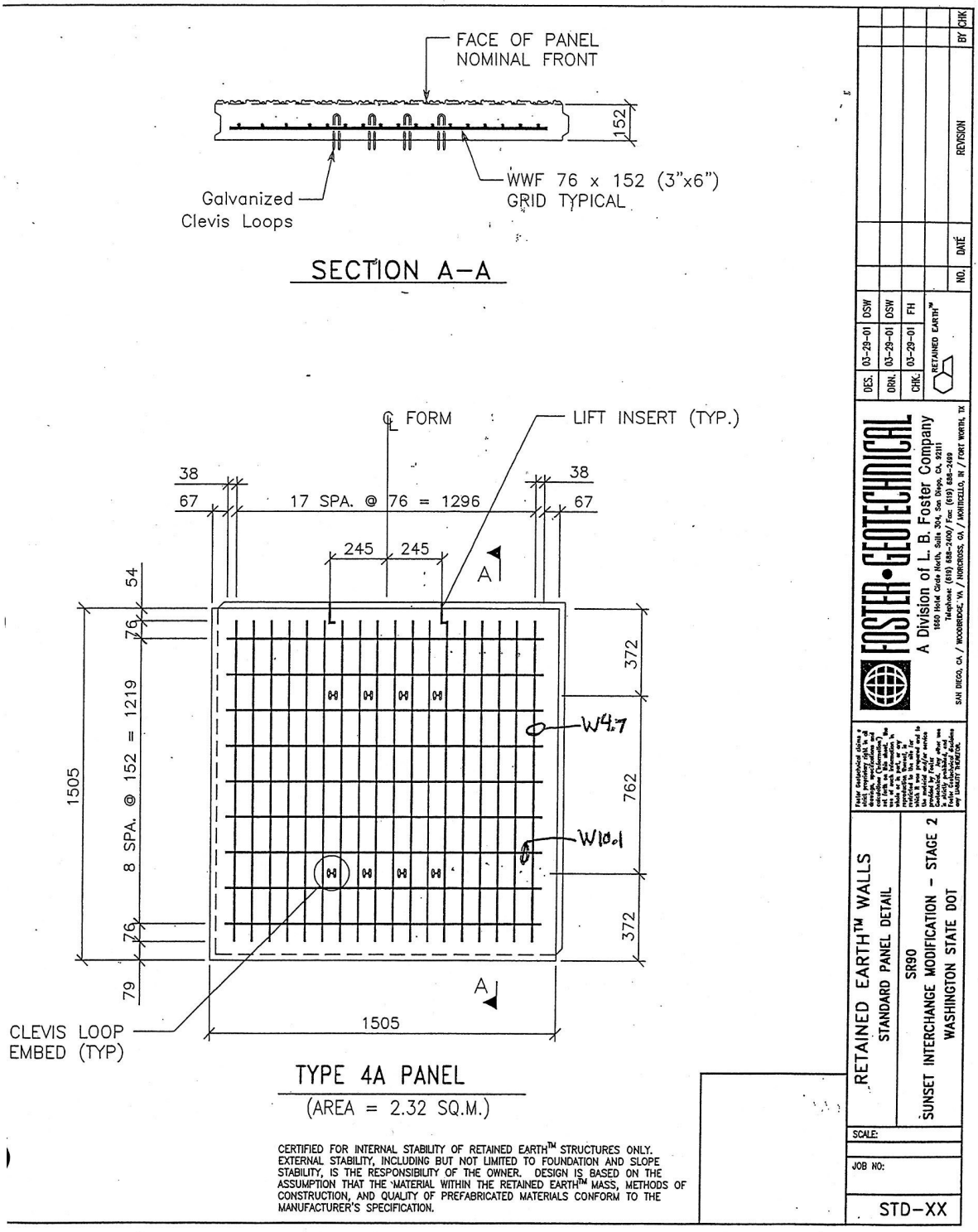
Approved details for the LB Foster Retained Earth™ concrete 5 ft x 5 ft panel faced retaining wall system are provided in the following plan sheets. Note that the two stage wall (i.e., welded wire face with concrete panels installed after wall completion) is not approved for WSDOT use. Exceptions and additional requirements regarding the approved details are as follows:

- Several plan sheets that detail panels with larger dimensions than the 5 ft by 5 ft panel. While it is feasible to use larger panels, only the 5 ft by 5 ft panel series is specifically preapproved for use in WSDOT projects. Other panel sizes may be used by special design, with the approval of the State Bridge Design Engineer and the State Geotechnical Engineer, provided a complete wall design with detailed plans are developed and included in the construction contract (i.e., walls with larger facing panels shall not be submitted as shop drawings in design-bid-build projects).
- Several of the details shown provide only metric dimensions. The closest English system dimensions shall be used, unless the project is a metric project.
- In the plan sheet on page 7, regarding the filter fabric shown, WSDOT reserves the right to require the use WSDOT Standard Specification materials as specified in Standard Specification Section 9-33 that are similar to those specified in this plan sheet.
- In the plan sheets on pages 2 and 6, there should be a minimum cover of 4 inches of soil between the steel grid in the soil and the traffic barrier reaction slab.



MSE RETAINING WALL: TYPICAL SECTION
SCALE: N.T.S.




FACE OF PANEL
NOMINAL FRONT
152
Galvanized
Clevis Loops
WWF 76 x 152 (3"x6")
GRID TYPICAL
SECTION A-A
℄ FORM
LIFT INSERT (TYP.)
38
67
17 SPA. @ 76 = 1296
38
67
245
245
A
54
76
8 SPA. @ 152 = 1219
76
79
1505
372
762
372
W4.7
W10.1
A
1505
CLEVIS LOOP
EMBED (TYP)
TYPE 4A PANEL
(AREA = 2.32 SQ.M.)
CERTIFIED FOR INTERNAL STABILITY OF RETAINED EARTH™ STRUCTURES ONLY. EXTERNAL STABILITY, INCLUDING BUT NOT LIMITED TO FOUNDATION AND SLOPE STABILITY, IS THE RESPONSIBILITY OF THE OWNER. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE RETAINED EARTH™ MASS, METHODS OF CONSTRUCTION, AND QUALITY OF PREFABRICATED MATERIALS CONFORM TO THE MANUFACTURER'S SPECIFICATION.
DES. 03-29-01 DSW
DRN. 03-29-01 DSW
CHK. 03-29-01 FH
RETAINED EARTH™
NO. DATE REVISION BY CHK
FOSTER•GEOTECHNICAL
A Division of L. B. Foster Company
1660 Hotel Circle North, Suite 304, San Diego, CA, 92111
Telephone (619) 688-2400/ Fax: (619) 688-2499
SAN DIEGO, CA / WOODBRIDGE, VA / HORSESHOE, CA / MONTICELLO, IN / FORT WORTH, TX
RETAINED EARTH™ WALLS
STANDARD PANEL DETAIL
SR90
SUNSET INTERCHANGE MODIFICATION - STAGE 2
WASHINGTON STATE DOT
SCALE:
JOB NO:
STD-XX

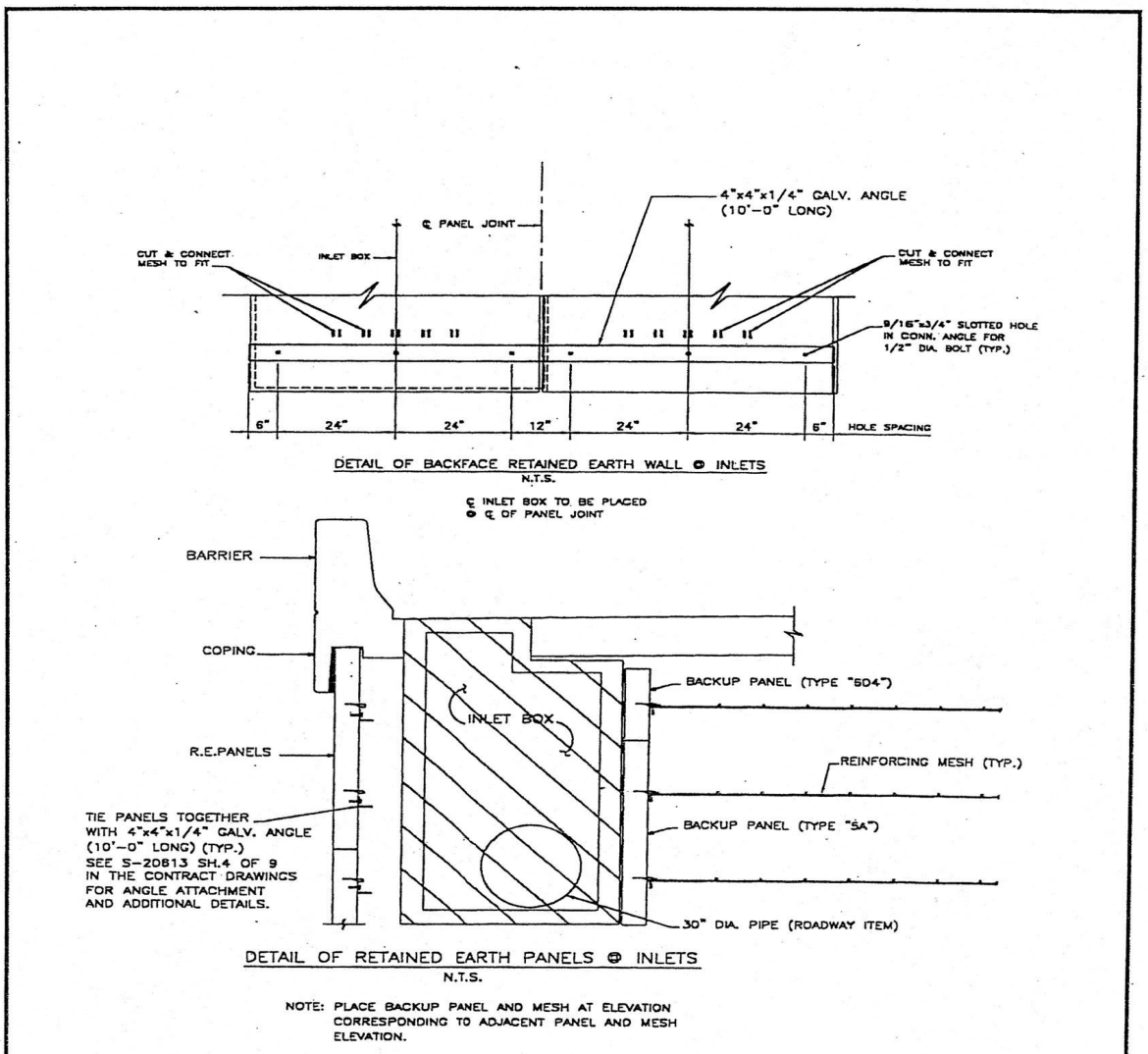


Fig. 2. Avoidance of obstruction using back-up panels

Date 7/13/00		FOSTER•GEOTECHNICAL A Division of L. B. Foster Company
Design by WJN		
Project No.		Job No. MSE-SR Of 4 52

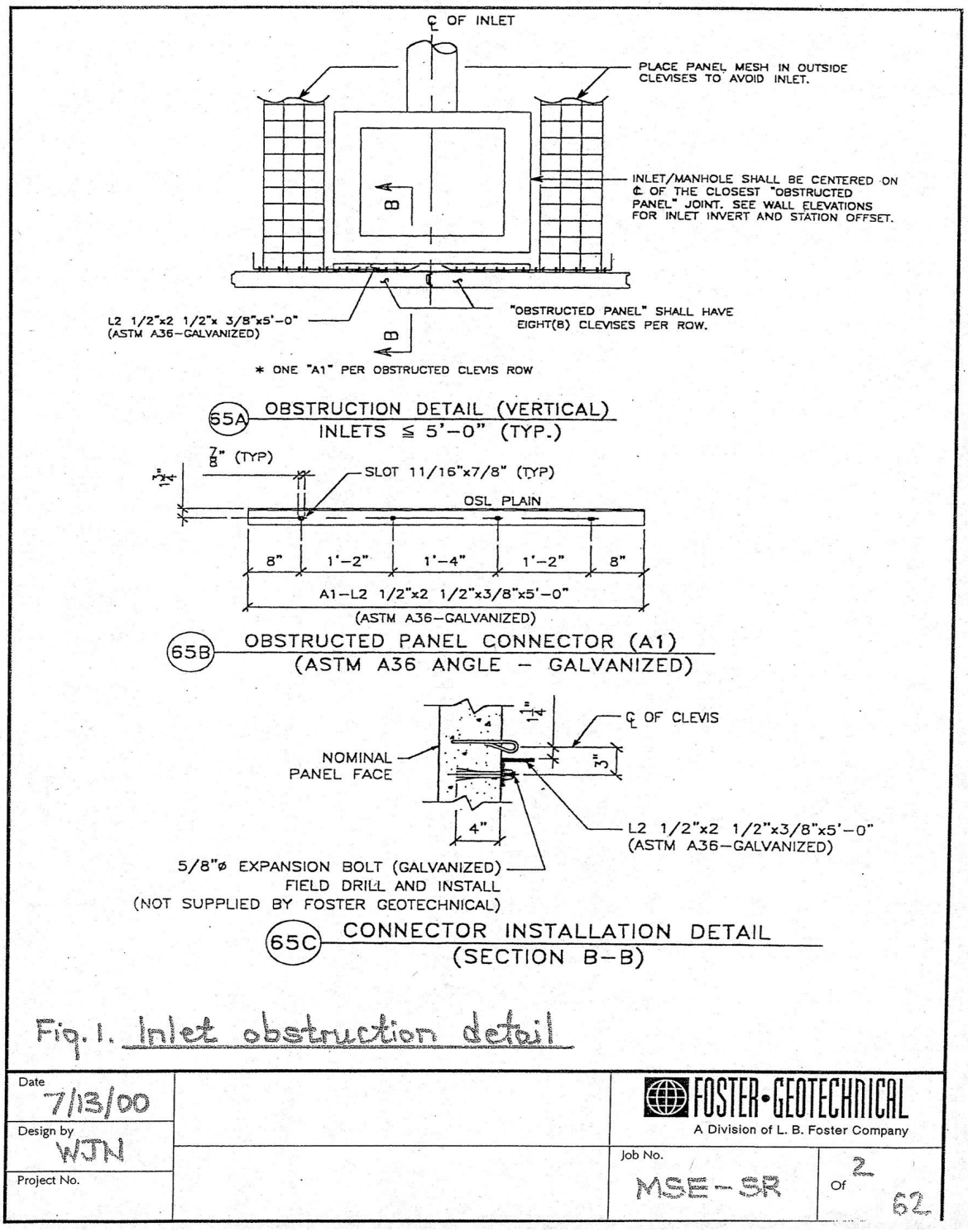
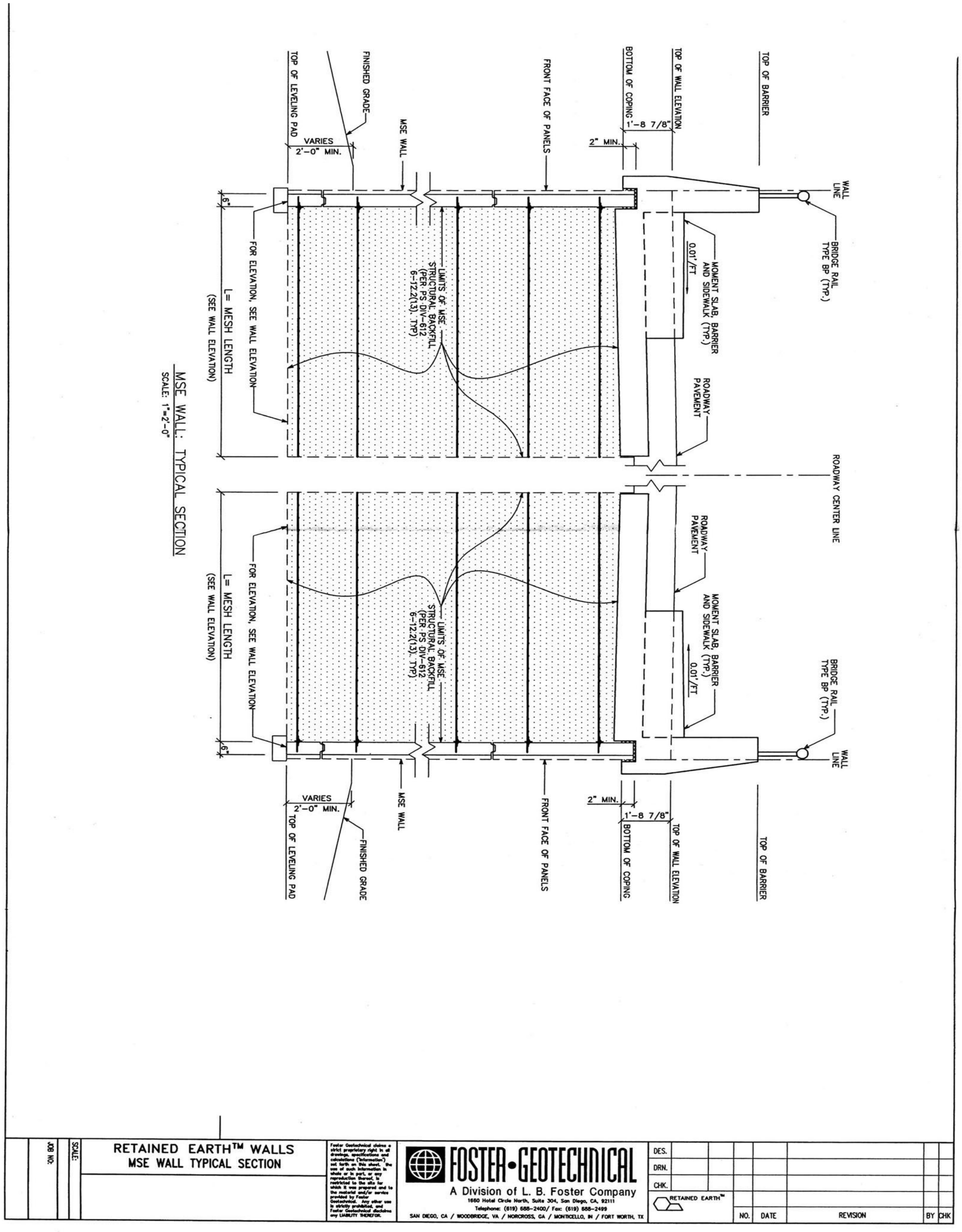


Fig. 1. Inlet obstruction detail

Date 7/13/00		FOSTER·GEOTECHNICAL A Division of L. B. Foster Company
Design by WJN		
Project No.		Job No. MSE-SR
		Of 2 62


MSE WALL: TYPICAL SECTION
SCALE: 1"=2'-0"
TOP OF BARRIER
TOP OF WALL ELEVATION
BOTTOM OF COPING
FRONT FACE OF PANELS
MSE WALL
FINISHED GRADE
TOP OF LEVELING PAD
VARIES
2'-0" MIN.
2" MIN.
1'-8 7/8"
6"
WALL LINE
BRIDGE RAIL TYPE BP (TYP.)
MOMENT SLAB, BARRIER AND SIDEWALK (TYP.)
0.01'/FT
ROADWAY PAVEMENT
ROADWAY CENTER LINE
LIMITS OF MSE STRUCTURAL BACKFILL (PER PS DIV-612 6-12.2(13), TYP)
FOR ELEVATION, SEE WALL ELEVATION
L= MESH LENGTH
(SEE WALL ELEVATION)
RETAINED EARTH™ WALLS
MSE WALL TYPICAL SECTION
SCALE:
JOB NO:
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SAN DIEGO, CA / WOODBRIDGE, VA / NORCROSS, CA / MONTICELLO, IN / FORT WORTH, TX
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CHK.
RETAINED EARTH™
NO.
DATE
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BY
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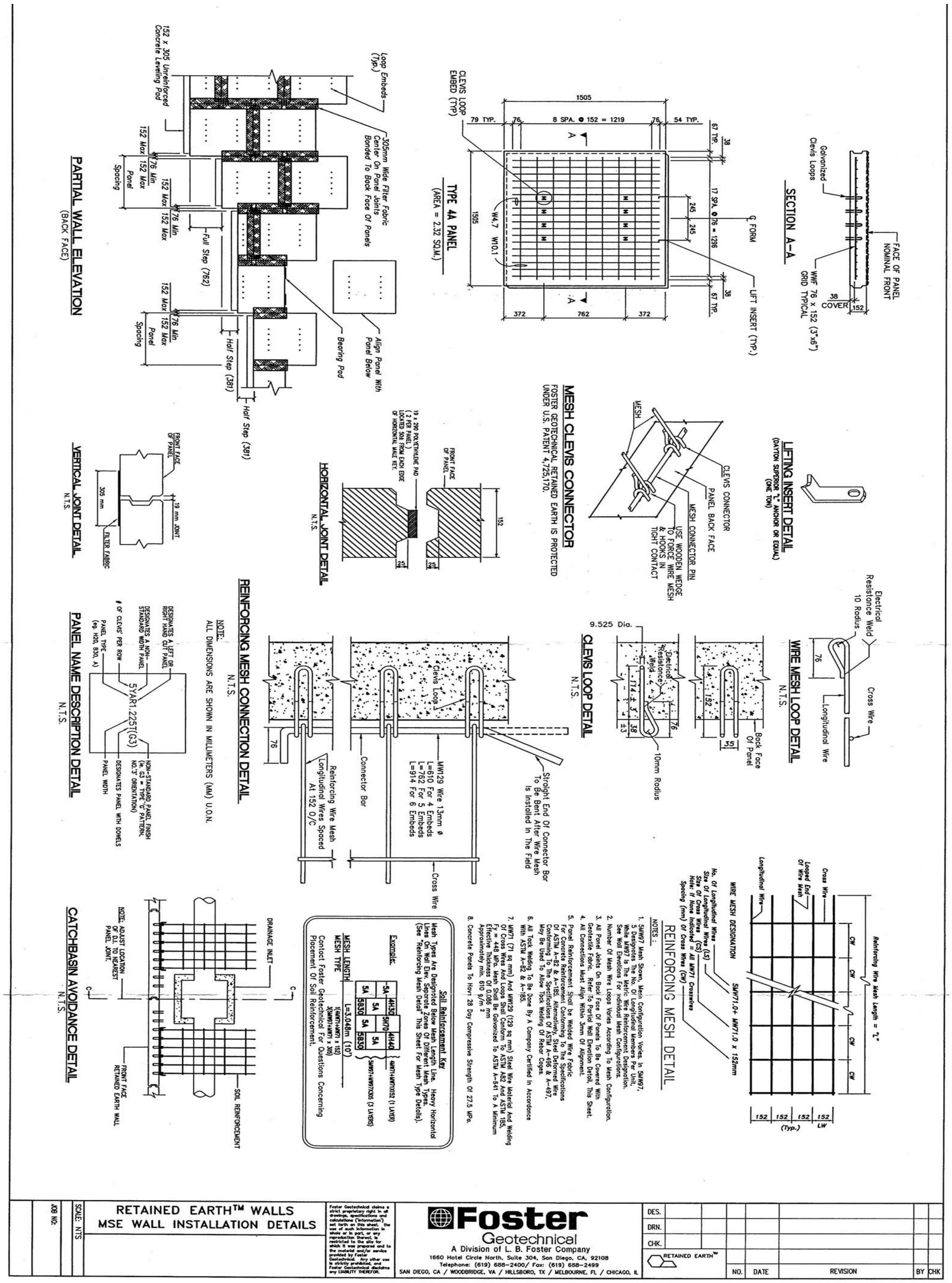
SECTION A–A
TYPE 4A PANEL
(AREA = 2.32 SQ.M.)
PARTIAL WALL ELEVATION
(BACK FACE)
LIFTING INSERT DETAIL
MESH CLEVIS CONNECTOR
FOSTER GEOTECHNICAL RETAINED EARTH IS PROTECTED UNDER U.S. PATENT 4,725,170.
HORIZONTAL JOINT DETAIL
VERTICAL JOINT DETAIL
WIRE MESH LOOP DETAIL
CLEVIS LOOP DETAIL
REINFORCING MESH CONNECTION DETAIL
NOTE:
ALL DIMENSIONS ARE SHOWN IN MILLIMETERS (MM) U.O.N.
PANEL NAME DESCRIPTION DETAIL
REINFORCING MESH DETAIL
CATCHBASIN AVOIDANCE DETAIL
RETAINED EARTH™ WALLS
MSE WALL INSTALLATION DETAILS
Foster
Geotechnical
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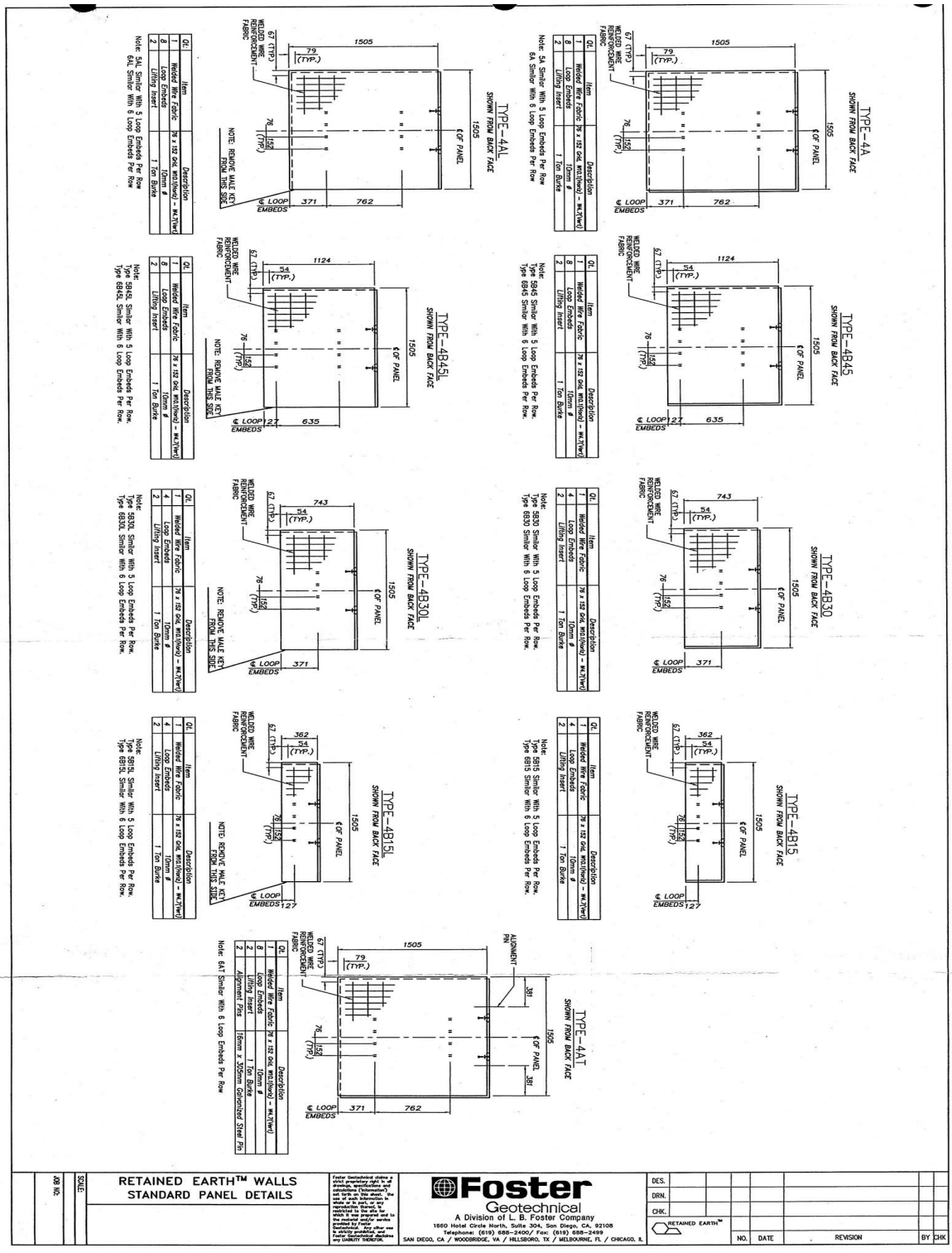
TYPE-4A
SHOWN FROM BACK FACE
TYPE-4AL
SHOWN FROM BACK FACE
TYPE-4845
SHOWN FROM BACK FACE
TYPE-4845L
SHOWN FROM BACK FACE
TYPE-4830
SHOWN FROM BACK FACE
TYPE-4830L
SHOWN FROM BACK FACE
TYPE-4815
SHOWN FROM BACK FACE
TYPE-4815L
SHOWN FROM BACK FACE
TYPE-4AT
SHOWN FROM BACK FACE
WELDED WIRE REINFORCEMENT FABRIC
NOTE: REMOVE MALE KEY FROM THIS SIDE
℄ LOOP EMBEDS
℄ OF PANEL
RETAINED EARTH™ WALLS
STANDARD PANEL DETAILS
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PANEL JOINT DETAIL

N.T.S.

WAFFLE PAD AT HORIZONTAL JOINT

HORIZONTAL & VERTICAL JOINT DETAIL